

WHAT IS CLAIMED IS:

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1. A method of distributing data units, said data units comprising an information portion and an identification portion, said identification portion identifying at least one characteristic of said data unit, said method comprising the steps of:

receiving a plurality of said data units on a multiple channel data stream, at least some of said data units being received sequentially; and

performing the following steps for each received data unit:

(a) storing the received data unit in a data buffer;

(b) decoding the identification portion of the data unit to identify the at least one characteristic of the data unit;

(c) determining whether the data unit should be distributed before or after one or more other of said data units based on the identified characteristic of the data unit; and

(d) transmitting the data unit in an order relative to other of said data units in accordance with said step of determining.

2. The method of claim 1 wherein said step of determining comprises the steps of:

comparing the identification portion of the data unit to predetermined information designating the order of distribution of said data units; and

determining the position of the data unit in an order of distribution of the received data units based on said step of comparing the identification portion.

3. The method of claim 1 wherein said step of determining comprises the steps of:

comparing the identification portion of the data unit to stored schedule information designating when each said data unit is to be distributed; and

determining when the data unit should be distributed based on said schedule information.

4. The method of claim 1 wherein said step of transmitting comprises the steps of:

reordering the distribution order of the received data units based on said step of determining;

outputting the data units to output ports in said distribution order to distribute the data units in an order different from the order in which they were received.

5. A method for routing and distributing data units, each data unit having an identification portion and an information content portion, said method using a switch with multiple data ports, a plurality of storage locations for storing and communicating data units and a controller for controlling said switch and said storage location, said method comprising the steps of:

receiving the data units in an information stream, said stream having said data units separated in the time domain so that said data units are sequentially received by a switch;

processing said data units by decoding the identification portion of each said

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data unit to identify the priority of the information content portion of said data unit;
routing each said data unit to a data port on said switch;
selecting a storage location to store said data unit and
communicating said data unit to said selected storage location to prioritize the
transmission of said data unit.

6. The method of claim 5 further comprising:
accumulating information about said identification portion of said data units
to calculate the total number of data units transmitted over a predetermined time
span, said calculated total about said identification portion of said data units being
maintained for each unique destination address, decoded in said step of processing
from said identification portion, for said data units passing through said switch over
said predetermined time span.

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7. The method of claim 6 further comprising:
generating a bill from said total number of data units transmitted over a
predetermined time calculated in said step of accumulating information by
comparing said accumulated total number of data units transmitted to a unique
destination address with a predetermined billing rate.

8. The method of claim 5 further comprising:
determining from said decoded identification portion of said data unit
whether said data unit should be distributed to multiple data ports on said switch.

9. The method of claim 5 further comprising:

comparing said decoded identification portion of said data unit with a predetermined schedule to determine a re-transmission time for said data unit and determining a data port on said switch for said re-transmission.

10. The method of claim 5 further comprising:

accumulating information about said identification portion of said data units to calculate the total number of data units transmitted over a predetermined time span, said calculated total about said identification portion of said data units being maintained for each data port on said switch for said data units passing through said switch over said predetermined time span.

11. The method of claim 10 further comprising:

generating a bill from said total number of data units transmitted over a predetermined time calculated in said step of accumulating information by comparing said accumulated total number of data units transmitted to a data port with a predetermined billing rate.

12. A method for routing and distributing data units, each data unit having an identification portion and an information content portion, said method using a switch with multiple data ports, a plurality of storage locations for storing and communicating data units and a controller for controlling said switch and said storage location, said method comprising the steps of:

receiving the data units in an information stream, said stream having said data units separated in the time domain so that said data units are sequentially

received by a switch;

processing said data units by decoding the identification portion of each said data unit to identify the information content portion of said data unit;

comparing the identification portion of said data unit to predetermined timing data to determine a transmission time based on said identification portion of said data unit; and

transmitting said data unit based on said comparing step.

13. The method of claim 12 further comprising:

accumulating information about said identification portion of said data units to calculate the total number of data units transmitted over a predetermined time span, said calculated total about said identification portion of said data units being maintained for each unique destination address, decoded in said step of processing from said identification portion, for said data units passing through said switch over said predetermined time span.

14. The method of claim 13 further comprising:

generating a bill from said total number of data units transmitted over a predetermined time calculated in said step of accumulating information by comparing said accumulated total number of data units transmitted to a unique destination address with a predetermined billing rate.

15. The method of claim 12 further comprising:

determining from said decoded identification portion of said data unit

whether said data unit should be distributed to multiple data ports on said switch.

16. The method of claim 12 further comprising:

comparing said decoded identification portion of said data unit with a predetermined schedule to determine a re-transmission time for said data unit and determining a data port on said switch for said re-transmission.

17. A method for routing and distributing data units, each data unit having an identification portion and an information content portion, said method using a switch with multiple data ports, a plurality of storage locations for storing and communicating data units and a controller for controlling said switch and said storage location, said method comprising the steps of:

receiving the data units in an information stream, said stream having said data units separated in the time domain so that said data units are sequentially received by a switch;

processing said data units by decoding the identification portion of each said data unit to identify the information content portion of said data unit;

comparing said decoded identification portion of each said data unit to predetermined priority data to determine a transmission priority;

communicating an instruct-to-delay signal to cause a delay in the communication of said data units.

18. The method of claim 17 further comprising:
accumulating information about said identification portion of said data units to calculate the total number of data units transmitted over a predetermined time span, said calculated total about said identification portion of said data units being maintained for each unique destination address, decoded in said step of processing from said identification portion, for said data units passing through said switch over said predetermined time span.

19. The method of claim 18 further comprising:
generating a bill from said total number of data units transmitted over a predetermined time calculated in said step of accumulating information by comparing said accumulated total number of data units transmitted to a unique destination address with a predetermined billing rate.

20. The method of claim 17 further comprising:
determining from said decoded identification portion of said data unit whether said data unit should be distributed to multiple data ports on said switch.

21. The method of claim 17 further comprising:
comparing said identification portion of said data unit with a predetermined schedule to determine a re-transmission time for said data unit and determining a data port on said switch for said re-transmission.

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accumulating information about said identification portion of said data units

to calculate the total number of data units transmitted over a predetermined time span, said calculated total about said identification portion of said data units being maintained for each data port on said switch for said data units passing through said switch over said predetermined time span.

23. The method of claim 22 further comprising:

generating a bill from said total number of data units transmitted over a predetermined time calculated in said step of accumulating information by comparing said accumulated total number of data units transmitted to a data port with a predetermined billing rate.

24. A method for routing and distributing data units, said data units having a first identification portion and a second multimedia information portion using a switch with multiple data ports, a data buffer and a controller for controlling said switch comprising the steps of:

receiving the data units from a multiple channel data stream, said multiple channel data stream having data units separated in the time domain so that said data units are sequentially received on a data port on said switch;

processing said data unit by decoding said first portion of said data unit to identify the type of data in said second multimedia information portion and to identify an address that indicates routing information for said data unit;

assigning a transmission priority to said data unit based on said type of data in said second multimedia portion of said data unit determined by said step of processing said data unit by placing said data unit into said data buffer and;

transmitting said data unit based on said assigned priority determined by the type of data in said second multimedia information portion of said data unit to a data port on said switch.

25. The method of claim 24 further comprising:

accumulating information about said identification portion of said data units to calculate the total number of data units transmitted over a predetermined time span, said calculated total about said identification portion of said data units being maintained for each unique destination address, decoded in said step of processing from said identification portion, for said data units passing through said switch over said predetermined time span.

26. The method of claim 25 further comprising:

generating a bill from said total number of data units transmitted over a predetermined time calculated in said step of accumulating information by comparing said accumulated total number of data units transmitted to a unique destination address with a predetermined billing rate.

27. The method of claim 24 further comprising:

determining from said decoded identification portion of said data unit whether said data unit should be distributed to multiple data ports on said switch

28. The method of claim 24 further comprising:

comparing said identification portion of said data unit with a predetermined schedule to determine a re-transmission time for said data unit and determining a

data port on said switch for said re-transmission.

29. The method of claim 24 further comprising:

comparing said identification portion of said data unit with a predetermined schedule to determine a re-transmission time for said data unit and determining multiple data ports on said switch for said re-transmission.

30. The method of claim 28 further comprising:

verifying said re-transmission by receiving said re-transmitted data unit from said selected data port on said switch and repeating said step of processing said data unit to identify the type of data in said second multimedia information portion and to identify an address that indicated routing information for said data unit.

31. The method of claim 28 further comprising:

receiving a new transmission schedule and changing said predetermined transmission schedule.

32. the method of claim 24 further comprising:

receiving a new billing rate schedule and changing said predetermined billing rate schedule.

33. A method for routing and distributing multimedia data, said multimedia data having a first identification portion and a second multimedia information portion using a network of switches each with multiple ports and a controller for controlling said switch comprising the steps of:

receiving the multimedia data at an input on a first switch, said multimedia

data having multimedia signal units separated in the time domain so that said multimedia data is sequentially received;

processing said multimedia signal by decoding said first encoded portion of said multimedia signal to determine a destination address for said multimedia signal;

routing said multimedia signal to an output port on said switch based on said processing step;

storing said multimedia signal in a temporary storage location based on said routing step that was determined in said processing step;

transmitting said multimedia signal from said temporary storage device at an asynchronous time, said asynchronous time determined by decoding said first encoded portion of said multimedia signal to determine the type of data in said second multimedia information portion to a second switch.

34. The method of claim 33 further comprising:

determining from said decoded identification portion of said data unit whether said data unit should be distributed to multiple data ports on said switch.

35. The method of claim 33 further comprising:

comparing said decoded identification portion of said data unit with a predetermined schedule to determine a re-transmission time for said data unit and determining a data port on said switch for said re-transmission.

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36. The method of claim 33 further comprising:

accumulating information about said identification portion of said data units to calculate the total number of data units transmitted over a predetermined time span, said calculated total about said identification portion of said data units being maintained for each data port on said switch for said data units passing through said switch over said predetermined time span.

37. The method of claim 36 further comprising:

generating a bill from said total number of data units transmitted over a predetermined time calculated in said step of accumulating information by comparing said accumulated total number of data units transmitted to a data port with a predetermined billing rate.

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38. A method for coding, decoding, routing and distributing multimedia data, said multimedia data having a first identification portion and a second multimedia information portion using a multiple port switch and a controller comprising the steps of:

receiving the multimedia data units from a multiple channel data stream, said multiple channel data stream having multimedia data units separated in the time domain so that said multimedia data units have an asynchronous arrival at a data port on said switch;

processing said multimedia data unit by decoding said first portion of said multimedia data unit to identify the type of data in said second multimedia information portion and to identify an address that indicates routing information

for said data unit;

storing said multimedia signal in a temporary storage location based on said routing information determined in said processing step;

processing said multimedia data unit by decoding said second portion of said multimedia data unit and re-formatting said multimedia data from said second portion of said multimedia data unit;

re-timing said re-formatted multimedia data into a synchronous data stream.

39. The method of claim 38 further comprising:

transmitting said re-timed and re-formatted multimedia signal from said storage in a synchronous data stream, said synchronizing time determined by the data port on said switch selected by said address decoded from said first portion of said multimedia data unit in said step of processing.

40. The method of claim 38 further comprising:

transmitting said re-timed and re-formatted multimedia signal from said storage in a synchronous data stream, said synchronizing time determined by comparing said decoded multimedia identification portion of said multimedia data unit with predetermined data to determine a re-transmission rate for said multimedia signal.

41. The method of claim 38 further comprising:

accumulating information from said first identification portion of said multimedia data units to calculate the total number of multimedia data units transmitted over a predetermined time span, said calculated total about said

identification portion of said multimedia data units being maintained for each unique destination address, decoded in said step of processing from said identification portion, for said multimedia data units passing through said switch over said predetermined time span.

42. The method of claim 41 further comprising:

generating a bill from said total number of data units transmitted over a predetermined time calculated in said step of accumulating information by comparing said accumulated total number of data units transmitted to a unique destination address with a predetermined billing rate.

43. The method of claim 38 further comprising:

determining from said decoded identification portion of said multimedia data unit whether said multimedia data units should be distributed to multiple data ports on said switch.

44. The method of claim 38 further comprising:

comparing said decoded identification portion of said multimedia data unit with a predetermined schedule to determine a re-transmission time for said multimedia data unit and determining a data port on said switch for said re-transmission.

45. The method of claim 38 wherein said multimedia information is analog audio.

46. The method of claim 38 wherein said multimedia information is digital

audio.

47. The method of claim 38 wherein said multimedia information is analog video.

48. The method of claim 38 wherein said multimedia information is digital video.

49. The method of claim 38 wherein said multimedia information is analog data.

50. The method of claim 38 wherein said multimedia information is digital data.

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